

ABSTRACT

Hypoxia is a dangerous condition that occurs when oxygen levels in the blood are too low, which can interfere with the functioning of vital organs such as the brain and heart. Detecting the symptoms of hypoxia early is very important to prevent more serious complications. This study aims to design and implement a real-time Internet of Things (IoT)-based hypoxia symptom detection system. The system uses a MAX30100 sensor to measure oxygen levels (SpO_2) and heart rate. The data generated is sent to the Blynk app via an ESP8266 microcontroller, allowing users to monitor their health condition directly from their smartphone. The system was also tested using Wireshark to evaluate network performance, including analysis of delay, jitter, and packet loss. Test results show that the system can detect changes in oxygen levels and heart rate with high accuracy and send data in real-time with low delay. This system is expected to help users monitor their physical condition independently and provide early warnings if hypoxia symptoms occur. Test results also showed that the system can detect oxygen levels and heart rate with good accuracy, with an average error of 4.8% in heart rate measurements (BPM) and 2.5% in oxygen level measurements (SpO_2).

Keywords: Hypoxia, IoT, ESP8266, MAX30100, Blynk, Heart Rate, Oxygen Saturation.